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EXAMINER ISAAC, STANETTA D				
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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* SARAH E. KIM,  
R. SCOTT LIST,  
JAMES G. MAVEETY,  
ALAN M. MYERS, and  
QUAT T. VU

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Appeal 2008-006096  
Application 10/669,205  
Technology Center 2800

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Decided: August 27, 2009

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Before CHUNG K. PAK, JEFFREY T. SMITH, and  
MICHAEL P. COLAIANNI, *Administrative Patent Judges*.

COLAIANNI, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants seek review under 35 U.S.C. § 134 from the Examiner's rejections of claims 14, 16, and 17 in the Final Office Action. This Board has jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

### STATEMENT OF THE CASE

Appellants' invention is directed to a method of cooling integrated circuitry with an electroosmotic pump and a recombiner having a catalyst to recombine the gaseous components and reform water (Spec. 10-11).

Claim 14 is illustrative:

14. A method comprising:

forming a trench in an integrated circuit substrate;

lining the trench with a catalyst material to remove gases from a circulating fluid;

forming channels that align with said trench to allow fluid circulation completely across said substrate from one side of said substrate to the other and through said trench; and

protecting said catalyst when forming said channels.

The Examiner cites and relies upon the following prior art as evidence of unpatentability:

Arik

US 6,864,571 B2

Mar. 8, 2005

Kotz et al., "Chemistry & Chemical Reactivity," Second Edition, Saunders College Publishing, Index/Glossary 1-6 (1991).

The Examiner maintains the following rejections of the pending claims:

1. Claim 14 stands rejected under 35 U.S.C. § 102(e) over Arik.
2. Claims 16 and 17 stand rejected under 35 U.S.C. § 103(a) over Arik.

## ISSUE

Have Appellants shown that the Examiner reversibly erred in finding that Arik teaches a catalyst that removes gases from a circulating fluid and channels that are aligned with the trench to allow fluid circulation completely across the substrate from one side of the substrate to the other and through the trench as recited by claim 1? We decide this issue in the affirmative.

## PRINCIPLES OF LAW

“To anticipate a claim, a prior art reference must disclose every limitation of the claimed invention, either explicitly or inherently.” *In re Schreiber*, 128 F.3d 1473, 1477 (Fed. Cir. 1997).

## FINDINGS OF FACT (FF)

The following facts are supported by a preponderance of evidence in the record.

1. Arik discloses forming a catalyst coating on a groove surface that is effective for nucleating growth of nanotubes in the groove (col. 7, ll. 47-56; col. 8, ll. 45-51).
2. Arik does not disclose that the catalyst layer removes gases from the circulating fluid in the groove.
3. Arik further discloses that the grooves are formed and sealed to form enclosed channels where water is vaporized and condensed to cool the integrated circuitry (col. 8, ll. 35-68; col. 9, ll. 1-35). Arik does not disclose that the channels extend “completely across said

substrate from one side of said substrate to the other and through said trench.”

4. The Examiner finds that Arik “suggests” that the catalyst material removes gases from the circulating fluid (Ans. 4-5). The Examiner further finds that Arik’s Figure 5 shows that fluid vapor 130 is condensed 132 by the catalyst coating, which constitutes removing gases from the liquid to the vapor form (Ans. 5). The Examiner further finds that based on the definition of a catalyst, Arik’s catalyst is “chemically *reacting* with the liquid to remove gases from a liquid while circulating through the micro-channel” (Ans. 5).
5. The Examiner finds that Arik “implies that the grooves would have been formed across either wafer from side to side, since the fluid flows through the channels formed within the grooves (Ans. 5).

## ANALYSIS

With regard to the catalyst claim feature, the Examiner contends that Arik’s Figure 5 shows that the catalyst 124 removes gases from the circulating fluid by condensing the fluid vapor 130 into condensate 132.

However, Arik does not disclose that catalyst layer 124 removes the gaseous components of the circulating fluid. Rather, Arik discloses that the catalyst is used to initiate formation of nanotube structures. Accordingly, there is no basis for the Examiner’s purely speculative finding that the catalyst removes gases from the circulating fluid. The Examiner’s mere citation of a “catalyst” definition does not provide the necessary technical reasoning to support a finding that Arik’s catalyst chemically reacts with the

fluid and inherently removes gases from a circulating fluid (Ans. 5). Indeed, the condensing of the fluid vapor 130 to condensate 132 is a physical, not chemical, transformation, which further indicates that the catalyst does not appear to play any role in removing gases from the circulating fluid.

Regarding the feature that the channels extend “completely across” the substrate, the Examiner finds that Arik “implies” such a feature because the fluid flows through the channels within the grooves. However, the Examiner does not explain how microchannels 120 or 214 (i.e., grooves), for example in Figures 4 and 5, or 7, that are part of a sealed structure can extend completely across the entire surface (i.e., form openings in both sides of the substrate). Specifically regarding the Figure 5 embodiment, wafers 104 and 102 are bonded together to form sealed channels. As such, the microchannels cannot extend completely (i.e., entirely) across the substrate from one side to the other side and through the trench, otherwise the microchannels would not be sealed.

Regarding Arik’s Figure 7 embodiment, wafers 204 and 206 are bonded together to form a sealed channel 214 that communicates with a circulation system. However, Arik does not teach that the microchannels 214 extend completely across the substrate from side-to-side and the Examiner’s reasoning that fluid flows through the channel is insufficient to support a finding based on inherency. As noted above, the fluid flows in a sealed channel too.

For the above reasons, we find that Appellants have shown that the Examiner erred in finding that Arik discloses all the features of independent claim 14. Therefore, we reverse the Examiner’s § 102(e) rejection of claim

14. Because claims 16 and 17 both depend on claim 14, we reverse the § 103 rejection of those claims.<sup>1</sup>

ORDER

We reverse all the Examiner's rejections.

REVERSED

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1616 S. VOSS ROAD, SUITE 750  
HOUSTON TX 77057-2631

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<sup>1</sup> The Examiner also has not shown that it would have been obvious to employ platinum and lead as catalysts in Arik's method. The fact that platinum and lead are known catalyst materials does not demonstrate that they are useful for Arik's purpose, i.e., initiating the formation of nanotube structures.